Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A method for distributing at least two gases upstream onto a catalyst, comprising:

a) providing a gas distributor comprising a body having a plurality of channels therethrough and a plurality of outlets from said channels, said outlets configured on one downstream face of said gas distributor ~~so as~~ to distribute gas onto the catalyst;

b) feeding a first gas into the gas distributor;

c) separately feeding a second gas into the gas distributor simultaneously with step b); and

d) allowing the first and second gases to flow through the gas distributor, out through the outlets, and into contact with the catalyst.

2. (Original) The method of claim 1 wherein steps b) through d) are carried out such that gases flow across said catalyst at a gas hourly space velocity of at least 20,000 h^{-1}.

3. (Currently amended) The method of claim 1 wherein steps b) through d) are carried out such that gases flow across said catalyst at a gas hourly space velocity of about 100,000 - 25,000,000 h^{-1} ~~up to 100,000,000 h^{-1}~~.

4. (Original) The method of claim 1 wherein the gas distributor comprises a plurality of plates that have been etched and bonded together.

5. (Original) The method of claim 1 wherein the gas distributor has at least 7 outlets.

6. (Currently amended) The method of claim 1 wherein the gas distributor has at least 100 outlets per square foot ~~inch~~.

7. (Currently amended) The method of claim 1 wherein the gas distributor has at least 1,000 outlets per square foot ~~inch~~.

8. (Currently amended) The method of claim 1 wherein the gas distributor has at least 2,000 outlets per square foot ~~inch~~.

9. (Original) The method of claim 1 wherein the first and second gases are combined within the gas distributor such that the gas exiting through the outlets comprises a mixture of the first and second gases.

10. (Original) The method of claim 1 wherein the first and second gases are not combined within the gas distributor and the first and second gases are mixed between the outlets and the catalyst.

11. (Original) The method of claim 1 wherein the pressure drop across the gas distributor is less than 30 psi.

12. (Currently amended) The method of claim 1 wherein each channel has an inlet opening and an outlet opening, and the gas distributor has a ratio of the sum of the areas of the inlet openings to the sum of the areas of the outlet openings ~~is~~ between about 1:2 and 1:10.

13. (Currently amended) The method of claim 12 wherein the ratio of the sum of the areas of the inlet openings to the sum of the areas of the outlet openings is between about 1:2 and 1:6.

14. (Currently amended) The method of claim 1 wherein each channel has an inlet and an outlet, and further has at least one change in direction between its inlet and its outlet.

15. (Original) The method of claim 1 wherein some channels share an outlet opening.

16. (Original) The method of claim 1 wherein some channels share an inlet opening.

17. (Currently amended) A process for converting a hydrocarbon-containing feed gas to liquid hydrocarbon products comprising:

a) providing a catalyst in a syngas reactor and a micro-channel gas distributor positioned upstream of the catalyst in the syngas reactor;

ba) flowing the hydrocarbon-containing feed gas and an oxygen-containing gas through a the micro-channel gas distributor having a plurality of gas outlets whereby at least 25 outlets per square foot are configured on a downstream face of said gas distributor so as to produce a reactant gas stream;

cb) reacting the reactant gas stream in a the syngas reactor while contacting the reactant gas stream with the catalyst under conditions effective to produce a syngas stream comprising hydrogen and carbon monoxide; and

dc) reacting at least a portion of the syngas stream in a synthesis reactor under conditions effective to produce liquid hydrocarbon products.

18. (Currently amended) The process according to claim 17 wherein step cb) includes keeping the temperature of the reactant gas stream at about 30°C - 750°C, contacting the reactant gas stream with a the catalyst, keeping the temperature of the catalyst at about 600-2,000°C, and maintaining the reactant gas stream at a pressure of about 100-40,000 kPa ~~(about 1 - 40 atmospheres)~~ while contacting the catalyst.

19-28. (Cancelled)

29. (New) The process according to claim 17 wherein the gas distributor is configured such that the hydrocarbon-containing feed gas and the oxygen-containing gas are not combined within the gas distributor, and further wherein the hydrocarbon-containing feed gas and the oxygen-containing gas are mixed after exiting said outlets.

30. (New) The process according to claim 17 wherein the hydrocarbon-containing feed gas and the oxygen-containing gas are maintained in separate sets of flow channels with interspersed outlets and do not mix during their transit through the gas distributor to emerge as interspersed streams from the gas distributor via said outlets.

31. (New) The process according to claim 17 wherein the gas distributor has 100 or more outlets per square foot.

32. (New) A method of partially oxidizing a feed gas, comprising:

providing a catalyst bed comprising a catalyst;

providing a gas distributor disposed upstream of said catalyst bed, said gas distributor comprising a body having a plurality of channels therethrough, and a plurality of outlets from said channels, said outlets being configured in a downstream face of said gas distributor for distributing gas across the catalyst bed;

feeding a feed gas into one set of channels of the gas distributor, and simultaneously feeding an oxygen-containing gas into a separate set of flow channels, wherein the outlets of the separate set of flow channels are interspersed across the downstream face with the outlets of the set of channels into which the feed gas is fed, wherein the gas distributor has at least 20 outlets for each gas per square foot;

allowing the feed gas and the oxygen-containing gas to flow separately without mixing during their transit through the gas distributor and to exit the downstream face of the gas distributor via said interspersed outlets to then mix upon exiting the gas distributor to produce a reactant gas stream; and

contacting the catalyst with the reactant gas mixture while the reactant gas mixture passes over, or through the catalyst at a gas hourly space velocity in the range of about 20,000 h^{-1} to about 100,000,000 h^{-1} under conditions effective to produce a syngas stream comprising hydrogen and carbon monoxide.

33. (New) The method according to claim 32 wherein the channels have substantially the same length.

34. (New) The method according to claim 32 wherein the outlets are distributed evenly across the downstream face.

35. (New) The method according to claim 32 wherein the set of channels for each gas has inlets twice as closely packed as its respective outlets.

36. (New) The method according to claim 32 wherein each channel has at least two turns between its inlet and its outlet.

37. (New) The method according to claim 32 wherein the gas distributor has 100 or more outlets per square foot.

38. (New) The method according to claim 32 wherein the gas distributor has 1,000 or more outlets per square foot.